



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,194	09/20/2005	Fumiyasu Nomura	TOR-104US	5582
23122	7590	05/14/2009		
RATNERPRESTIA P.O. BOX 980 VALLEY FORGE, PA 19482			EXAMINER WONG, EDNA	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 05/14/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,194

Applicant(s)

NOMURA ET AL.

Examiner

EDNA WONG

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 8 and 11-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

This is in response to the Amendment dated March 18, 2009. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Response to Arguments

Election/Restrictions

This application contains claims **11-20** drawn to an invention nonelected without traverse in the reply filed on December 2, 2008.

Drawings

Figure **17** should have been designated by a legend such as --Prior Art-- because only that which is old is illustrated.

The drawing was received on March 18, 2009. This drawing is acceptable.

Specification

The disclosure has been objected to because of minor informalities.

The objection of the disclosure has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

I. Claims **1-10** have been rejected under 35 U.S.C. 112, first paragraph, because

the specification, while being enabling for electroplating, does not reasonably provide enablement for forming. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to carry out the invention commensurate in scope with these claims.

The rejection of claims 1-10 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

II. Claims **1-10** have been rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the method steps.

The rejection of claims 1-10 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 102/103

I. Claims **1, 3 and 9-10** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **JP 63-250492** ('492).

The rejection of claims 1, 3 and 9-10 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 63-250492 ('492) has been withdrawn in view of Applicants' amendment.

II. Claims **1 and 3** have been rejected under 35 U.S.C. 102(b) as anticipated by or,

in the alternative, under 35 U.S.C. 103(a) as obvious over **GB 551,103** ('103).

The rejection of claims 1 and 3 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over GB 551,103 ('103) has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

I. Claims **2 and 7-8** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **GB 551,103** ('103) as applied to claims 1 and 3 above, and further in view of **JP 07-022473** ('473).

The rejection of claims 2 and 7-8 under 35 U.S.C. 103(a) as being unpatentable over GB 551,103 ('103) as applied to claims 1 and 3 above, and further in view of JP 07-022473 ('473) has been withdrawn in view of Applicants' amendment.

II. Claims **4-6** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **GB 551,103** ('103) as applied to claims 1 and 3 above, and further in view of **Masui et al.** ("Warp Control in Strip Processing Plant", *ISIJ International*, Vol. 31 (1991), No. 3, pp. 262-267).

The rejection of claims 4-6 under 35 U.S.C. 103(a) as being unpatentable over GB 551,103 ('103) as applied to claims 1 and 3 above, and further in view of Masui et al. has been withdrawn in view of Applicants' amendment.

III. Claims **9 and 10** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **GB 551,103** ('103) as applied to claims 1 and 3 above, and further in view of **Beyer et al.** (US Patent No. 3,794,571).

The rejection of claims 9 and 10 under 35 U.S.C. 103(a) as being unpatentable over GB 551,103 ('103) as applied to claims 1 and 3 above, and further in view of Beyer et al. has been withdrawn in view of Applicants' amendment.

Response to Amendment

Claim Rejections - 35 USC § 103

Claims **1-5 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 07-022473** ('473) in view of **JP 63-250492** ('492) and **Masui et al.** ("Warp Control in Strip Processing Plant", *ISIJ International*, Vol. 31 (1991), No. 3, pp. 262-267).

JP '473 teaches a method for producing a plated film, comprising the steps of:

- carrying a resin film having a conductive surface **2** (= a polyimide film having a 0.2 μm copper layer) [page 5, [0022]] into a plating solution **7** (= an electrolysis solution) accommodated in a plating bath **1** (= a plating tub) provided with an anode **3** (page 3, [0012]),
- passing the resin film through the plating solution (= the deflector roller 4 for making the carried-in film 2 reverse and take out is formed in the tub) [page 3, [0011]].
- carrying the resin film from the plating bath to run along a cathode roll **5** which is

arranged outside and in the downstream side of the plating bath (= and the power feeding roller 5 for performing conveyance and energization of the film 2 is formed in the upper part of the plating tub 1 at the carrying-in and taking-out side, respectively) [page 3, [0011]; and Figs 1 and 2].

The conductivity σ of the liquid constituting the liquid layer is controlled by means of the concentration of an electrolyte mainly composed of sulfuric acid (= 180 g/l sulfuric acid) [page 5, [0023]].

The conductivity σ of the liquid constituting the liquid layer is from 1 mS/cm to 100 mS/cm (= the conductivity σ of the copper electrolytic solution) [page 5, [0023]]..

The plating layer is composed of copper (page 5, [0020]).

The resin film is made of a polyimide resin or polyester resin (= a polyimide) [page 5, [0022]].

The method of JP '473 differs from the instant invention because JP '473 does not disclose the following:

- a. Wherein the conductive surface of the resin film is brought into electrical contact with the cathode roll through a liquid layer for electroplating a plating layer on the conductive surface of the film, as recited in claim 1.
- b. Wherein the liquid layer exists in the gap, as recited in claims 2 and 3.

JP '473 teaches that the deflector roller 4 for making the carried-in film 2 reverse and take out is formed in the tub, and the power feeding roller 5 for performing

conveyance and energization of the film 2 is formed in the upper part of the plating tub 1 at the carrying-in and taking-out side, respectively (page 3, [0011]; and Figs 1 and 2).

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because the conductive surface of the resin film, when carried in and taken out of the plating tub, would have dragged out, or attracted by capillary action, an electrolyte liquid layer on its surface.

Furthermore, *JP '492* teaches that water and an electrolyte solution are selectively jetted from nozzles 12, 13 on the rolls 2 to remove deposits and electrodeposited matter on the surfaces of the rolls 2 (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by JP '473 with wherein the conductive surface of the resin film is brought into electrical contact with the cathode roll through a liquid layer for electroplating a plating layer on the conductive surface of the film; and wherein the liquid layer exists in the gap because this would have removed deposits on the surface of the rolls as taught by JP '492 (abstract).

The reasons or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by Applicant (MPEP § 2144).

- c. Wherein the following relation is satisfied:

$$E_0 > [(I/C_s) \times d]/\sigma$$

where E_0 is the reduction potential of a metal constituting the plating layer; I is the value of a current flowing through the cathode roll for plating; C_s is the area of the conductive surface of the resin film in electrical contact with the cathode roll through the liquid layer; d is the thickness of a gap between the cathode roll and the conductive surface of the resin film; and σ is the conductivity of a liquid constituting the liquid layer, as recited in claim 1.

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because the JP '473 combination teaches a similar method as presently claimed. Similar processes can reasonably be expected have the similar properties.

d. Wherein the carrying tension T of the resin film is from 10 N/m to 320 N/m, as recited in claim 1.

The resin film 2 disclosed by the JP '473 naturally carries a tension T

(= ) [Figs. 1 and 2].

Like JP '473, *Masui* teaches the continuous electroplating of a strip material. Masui teaches that curl is restrained by line tension (page 262, "Introduction", first paragraph).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the carrying tension of the resin film described by JP '473 with wherein the carrying tension T of the resin film is from 10 N/m to 320 N/m because the carrying tension of the film is a result-effective variable and one skilled in the art has the skill to calculate the carrying tension of the film that would have determined the success of the desired reaction to occur, e.g., curl/warp control (MPEP § 2141.03 and § 2144.05(II)).

e. Wherein the thickness d of the gap is from 20 μm to 500 μm , as recited in claim 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the thickness d of the gap described by the JP '473 combination with wherein the thickness d of the gap is from 20 μm to 500 μm because the thickness d of the gap is a result-effective variable and one skilled in the art has the skill to calculate the thickness d of the gap that would have determined the success of the desired reaction to occur, e.g., establishing a good electrical contact between the cathode roll and the conductive surface of the film (MPEP § 2141.03 and § 2144.05(II)).

f. Wherein the thickness d of the gap is controlled by means of a carrying tension of the resin film, as recited in claim 5.

The resin film 2 disclosed by the JP '473 naturally carries a tension T



It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the thickness d of the gap described by the JP '473 combination with wherein the thickness d of the gap is controlled by means of a carrying tension of the resin film because the carrying tension of the film disclosed by the JP '473 combination would have naturally controlled the thickness d of the gap (which would have corresponded to the thickness of the thin film of electrolyte) to some degree.

It has been held that a newly discovered use or function of components does not necessarily mean the system is unobvious since this use or function may be inherent in the prior art. *Ex parte Pfeiffer* 135 USPQ 31.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edna Wong/
Primary Examiner
Art Unit 1795

EW
May 11, 2009